Volume Estimation - Release History

Approach and Results

- Review inventory records to determine volume(s) and date(s) of release(s)

Advantages

- Relatively simple and statistically accurate if accurate historical data are available

Disadvantages

- Data rarely accurate given numerous potential error sources (e.g., measurement technique, volume changes due to temperature)

Volume Estimation - TPH Concentration in Soil Samples

Approach and Results

- Convert TPH concentrations in soil samples to saturations and integrate these values over the area of contamination

Advantages

- Data are relatively easy to collect; several methods are available for data integration

Disadvantages

- Calculations required are relatively complicated; requires a lot of data to reduce uncertainty associated with calculated volume; results may differ among various methods for data integration; TPH analysis may not be representative of actual petroleum hydrocarbon saturations

Convert TPH Results to Saturation

$$S_o = TPH \times \frac{(1-\phi)\rho_{gr} \times 10^{-6} \frac{kg}{mg}}{\phi \rho_o}$$

where:

S_o	=	total hydrocarbon saturation (dimensionless)
TPH	=	total petroleum hydrocarbon concentration in mg/kg
ρ_{gr}	=	grain density (typically 2.65 g/cm^3)
ϕ	=	porosity (dimensionless)
ρ_o	=	density of the hydrocarbon, liquid (g/cm^3)

Convert TPH Results to Saturation

Free hydrocarbon saturation is:

$$S_{of} = S_o - S_r$$

Where:

S_{of} = free hydrocarbon saturation.

S_r = residual hydrocarbon saturation.